

WHAT IS CLAIMED IS:

- Sub 1*
1. A method for enhancing the performance of an imaging device, comprising the steps of:
    - (1) receiving first and second input pixels having an initial intensity value, the first and second input pixels being obtained by an imager having a fixed focal length;
    - (2) forming a first intermediate intensity value from the first input pixel based on the initial intensity value of the first input pixel and the value of a first weighting factor;
    - (3) forming a second intermediate intensity value from the second input pixel based on the initial intensity value of the second input pixel and the value of a second weighting factor; and
    - (4) combining the first and second intermediate intensity values to form an output pixel.
  2. The method of claim 1, wherein step (1) comprises the step of: receiving a group of input pixels to be used in forming the output pixel of step (4).
  3. The method of claim 2, wherein step (4) comprises the step of: combining one intermediate intensity value formed from each input pixel of the group to form the output pixel.
  4. The method of claim 3, wherein step (1) comprises the step of: receiving a group of at least sixteen input pixels.
  5. The method of claim 3, wherein step (4) comprises the step of: forming at least eight output pixels.

6. The method of claim 5, wherein each of steps (2) and (3) comprises the step of:  
multiplying the initial intensity value by at least eight weighting factors to form at least eight intermediate intensity values.
7. The method of claim 1, wherein step (4) comprises the step of:  
adding one intermediate intensity value formed in step (2) with one intermediate intensity value formed in step (3) to form one output pixel.
8. The method of claim 1, further comprising the step of:  
selecting the first and second weighting factors in accordance with an interpolation function.
9. The method of claim 1, further comprising the step of:  
selecting the first and second weighting factors in accordance with a cubic B-spline function.
10. The method of claim 1, further comprising the step of:  
selecting the first and second weighting factors in accordance with an  $n^{\text{th}}$ -order spline function.
11. The method of claim 1, further comprising the step of:  
selecting the first and second weighting factors in accordance with a sinc function.
12. The method of claim 8, wherein step (4) comprises the step of:  
forming a number of output pixels that is less than the number of input pixels received in step (1).

13. The method of claim 12, wherein step (4) comprises the step of:  
selecting the number of output pixels formed based on a distance  
between the imager and an object.

14. The method of claim 12, wherein step (4) comprises the step of:  
dynamically adjusting the number of output pixels formed based  
on a change in distance between the imager and an object.

15. The method of claim 12, wherein step (1) comprises the step of:  
low-pass filtering the input pixels.

16. A system for enhancing the performance of an imaging device  
having a fixed focal length, comprising:

a pixel receiving module to receive and temporarily store pixels  
obtained by an imager;

a pixel weighting module coupled to said pixel receiving module  
for forming intermediate intensity values based on weighting values and intensity  
values of pixels stored in said pixel receiving module; and

a pixel combining module coupled to said pixel weighting module  
for forming output pixels based on the intermediate intensity values formed by said  
pixel weighting module.

17. The system of claim 16, wherein said pixel receiving module is a  
buffer capable of receiving and temporarily storing a predetermined number of  
pixels.

18. The system of claim 17, wherein said pixel weighting module  
comprises:

a plurality of weighting cells coupled to said buffer, wherein each  
of said plurality of weighting cells receives at least two inputs, one input  
comprising a pixel intensity value from said buffer and one input comprising a

weighting value, and wherein each of said plurality of weighting cells combines the at least two inputs to form an intermediate intensity value.

19. The system of claim 18, wherein the number of output pixels formed by said pixel combining module is selected based on a distance between the imager and an object.

20. The system of claim 18, wherein the number of output pixels formed by said pixel combining module is dynamically adjusted based on a change in distance between the imager and an object.

21. A method for transforming image resolution, comprising the steps of:

- (1) retrieving an image having an initial resolution from a memory, the image comprising a first and second original pixel having an initial intensity value;
- (2) forming a first intermediate intensity value from the first original pixel based on the initial intensity value of the first original pixel and the value of a first weighting factor;
- (3) forming a second intermediate intensity value from the second original pixel based on the initial intensity value of the second original pixel and the value of a second weighting factor;
- (4) combining the first and second intermediate intensity values to form an interpolated pixel; and
- (5) repeating steps (2) through (4) for additional pixels of the image to form a copy of the image having a resolution that is different than the initial resolution.

22. The method of claim 21, wherein step (1) comprises the step of: retrieving the image from a network server used to store images.

23. The method of claim 21, wherein step (1) comprises the step of: receiving a group of original pixels to be used in forming the interpolated pixel of step (4).
24. The method of claim 23, wherein step (1) comprises the step of: low-pass filtering the original pixels.
25. The method of claim 23, wherein step (4) comprises the step of: combining one intermediate intensity value formed from each original pixel of the group to form the interpolated pixel.
26. The method of claim 21, further comprising the step of: selecting the first and second weighting factors in accordance with an interpolation function.
27. The method of claim 21, further comprising the step of: selecting the first and second weighting factors in accordance with a cubic B-spline function.
28. The method of claim 21, further comprising the step of: selecting the first and second weighting factors in accordance with an  $n^{\text{th}}$ -order spline function.
29. The method of claim 21, further comprising the step of: selecting the first and second weighting factors in accordance with a sinc function.
30. The method of claim 21, wherein step (5) comprises the step of: forming a copy of the image having a resolution that is determined based on a requester's access rights.